

## **Abstract**

An apparatus and associated method are disclosed which form a multiple beam forming network using time division multiplexing. Instead of having several parallel sets of beam forming network hardware running at a given sampling clock rate, a simpler, single piece of hardware is run at a faster rate equal to the given sampling clock rate times the number of beams to be formed. Each sample received from each element is time division multiplexed into a bit stream, one for each beam. These time division multiplex element samples are weighted to apply the desired phase shift/time delay per element. Each weighted resultant is delayed in a cascade delay pipeline and then combined with the cascade combiner to form a beam at a given time division instant. This process is repeated for the next set of time division multiplexed samples and weights from each element of the array at a given time to form the next beam. The process is repeated for all beams until the sampling time interval ends.

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